



STAT

Progress Report No. 2

Report Period: 19 February 1966 to 18 March 1966

Project Title: Gems Development (continuation)

PROJECT IDENTIFICATION

Contractor's Project No. - - - - - SPO 27203

Customer's Project No. - - - - - 99740-6

Contract No. - - - - - 
Dated: 5 January 1966

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FISCAL DATA

Type of Contract

CPFF

Total Contract Price



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Scheduled Completion Date

30 June 1967

Percent of Total Funds Expended 3.7% as of 25 February 1966

Percent of Work Completed 3.7% as of 25 February 1966

Declass Review by
NIMA/DOD

Objective of Project

The principal objective of this project is to determine how well the image quality of mission photography can be assessed by means of Gems. In order to accomplish this objective, psychological tests shall be performed wherein photographic images of known quality (Gems) are compared to mission photography. In fulfillment of this objective, a number of subtasks are being undertaken. These subtasks consist in the refinement of existing Gem making techniques, the study of alternate techniques, the study of Gems viewing equipment, and the preparation of Gem sets in large numbers.

Status of Overall Project

As expected, the overload on the Gems facility continued through the second month of this program. However, the expansion of the facility is proceeding as planned with completion scheduled for 4 April 1966. Preliminary work has been accomplished in planning various tasks of the overall program and some specific progress has been made in the refinement of existing Gems making techniques.

Customer clearance and briefing for one of contractor's personnel has been given. This clearance makes it possible to go ahead on the detailed planning of the psychological testing. To this end, a tentative meeting between contractor and subcontractor (on testing) has been scheduled for week of 28 March.

Work Completed During Report Period

a) Equipment Modification

The source assembly of the Gem making equipment is being modified. The 300 watt tungsten lamp and single diffuser are being replaced with a 650 watt bromine cycle lamp, reflector, and double diffuser configuration. Tests of this configuration show that improved uniformity of mask illumination and a threefold increase in intensity should be obtained.

b) Near Field Effects in Gem Making

The degradation of knife edge images by near field effects (Fresnel diffraction) has been determined for a limited number of Gems printing geometries. The preliminary results indicate that near field effects plays in at least some cases, a significant role in the formation of the image in the Gems making process. Further analysis will provide a guide in the proper selection of Gem printing parameters, viz., source to transparency, and transparency to film spacings

c) Psychophysical Testing

A work statement was prepared as a basis for the subcontract on psychophysical testing. A tentative meeting has been arranged for week of 28 March.

d) Gems Viewer

A request for quotation has been released describing a split field microscope comparator. This device is to be used for laboratory comparison of Gems and also is to be used in the design study of an automated Gems viewer.

Work for Next Period

The specific activity for the next period will include:

- a) Test of modified Gems Printer
- b) Continued analysis of near field effects
- c) Meeting on and planning for Psychophysical Testing
- d) Start of Gems viewer study